AMENDMENTS TO THE CLAIMS:

The following listing of claims supersedes all prior versions and listings of claims

in this application:

LISTING OF CLAIMS:

1. (Currently Amended) A node for In a network of nodes, the network

comprising a hierarchical structure in which a node is considered to be at a higher level

than a parent node to which it connects when joining the network, a node comprising

the network having a topology type in which each node joining the network is

constrained by the same connection rules to have a maximum number of connections,

and wherein the peripheral nodes are not allowed to have fewer connections than the

more central nodes in the network, the node being adapted to join the network by

applying said connection rules, the rules comprising the following steps in order to join a

new node to said network in which each node has a maximum of k connections:

identifying a parent node identifier arranged to identify a parent node at a lowest

level in the network that is able to maintain secondary connections to other nodes in the

network of the same lowest level;

requesting a connection requester arranged to request one of the secondary

connections of the parent node to other nodes in the network of the same level be

terminated and reallocated to the node if the identified parent node has no free links to become a primary connection between the identified parent node and the node;

~~initiating and maintaining~~ a connection initiator and maintainer arranged to initiate and maintain a specified number k-1 of further ~~secondary~~ connections between the node and other nodes in the network having the same level in the hierarchy as the node and which are advertising a spare connection;

wherein the node is constrained by the same connection rules as other nodes in the network to have a maximum number of k connections, and

if the node is a peripheral node the node has at least the same number of connections as more central nodes in the network.

2. Cancelled

3. (Previously Presented) A node according to claim 1, further adapted to attempt to maintain the specified number of k-1 further connections between the node and other nodes in the network by periodically carrying out:

for each unallocated one of the k-1 connections, selecting a node from one or more candidate nodes, and forming a connection with the selected node, until either the k-1 further connections have been successfully completed or there are no more candidate nodes.

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4. (Currently Amended) A node according to claim 3, wherein selecting [[the]] a peer node comprises selecting the peer node at random from the one or more candidate nodes.

5. (Previously Presented) A node according to claim 3, wherein selecting the node comprises selecting the node on the basis of the range of the candidate nodes to the node.

6. (Original) A node according to claim 5, wherein the network comprises an overlay network formed over an underlying network of nodes, and wherein the range between a candidate node and the node comprises the number of links between them in the underlying network.

7. Cancelled

8. (Currently Amended) A node according to claim [[1]] 6, further adapted to identify another node as a prospective parent node on the basis of the range of the other node to the node.

9. (Currently Amended) A node according to claim [[1]] 6, further adapted to identify another node as a prospective parent node if it is within a specified range of the node.

10. (Previously Presented) A node according to claim 1, further adapted, in the event that the primary connection fails, to re-establish a primary connection with another node which is at a lower level in the network hierarchy than the node.

11. (Previously Presented) A network, comprising a plurality of nodes each according to claim 1, in which the specified number k of connections is substantially the same for every node.

12. (Currently Amended) A method of joining a node to a network, the network comprising a hierarchical structure in which a node is considered to be at a higher level than a parent node to which it connects when joining the network, the network having a topology type in which each node joining the network is constrained by the same connection rules to have a maximum number of $\underline{k}$ connections, and wherein the peripheral nodes are not allowed to have fewer connections than the more central nodes in the network, the method comprising ~~applying said connection rules comprising~~

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the following steps in order to join a new node to said network in which each node has a

maximum of k connections:

identifying a parent node at a lowest level in the network that is to maintain

secondary connections to other nodes in the network of the same lowest level;

requesting one of the secondary connections of the parent node to other nodes

in the network of the same level be as the parent node is terminated and reallocated to

the node if the identified parent node has no free links to become a primary connection

between the identified parent node at the lower level in the network hierarchy and the

node;

initiating and maintaining a specified number k-1 of further connections between

the node and other nodes in the network having the same level in the hierarchy as the

node and which are advertising a spare connection, the node being constrained to have

at least the same number of connections as more central nodes in the network thereby

attempting to maintain k connections to each node.

13. Cancelled

14. (Previously Presented) A method according to claim 12, in which attempting

to maintain the specified number of k-1 further connections to the other nodes in the

network comprises periodically carrying out:

for each unallocated one of the k-1 connections, selecting a node from one or more candidate nodes, and forming a connection with the selected node, until either the k-1 further connections have been successfully completed or there are no more candidate nodes.

15. (Currently Amended) A method according to claim 12, in which selecting [[the]] a peer node comprises selecting the peer node at random from the one or more candidate nodes.

16. (Previously Presented) A method according to claim 14, wherein selecting the node comprises selecting the node on the basis of the range of the candidate nodes to the node.

17. (Original) A method according to claim 16, wherein the network comprises an overlay network formed over an underlying network of nodes, and wherein the range between a candidate node and the node comprises the number of links between them in the underlying network.

18. Cancelled

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19. (Currently Amended) A method according to claim [[12]] 17, comprising identifying another node as a prospective parent node on the basis of the range of the other node to the node.

20. (Currently Amended) A method according to claim [[12]] 17, comprising identifying another node as a prospective parent node if it is within a specified range of the node.

21. (Previously Presented) A method according to claim 12, further comprising, in the event that the primary connection to the identified parent fails, re-establishing a primary connection with another node which is at a lower level in the network hierarchy than the node.

22. (Previously Presented) A method of operating a network which comprises a plurality of nodes, the method comprising performing for every node the method according to claim 12, and in which the specified number k-1 of connections is substantially the same for every node.

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23. (Previously Presented) A tangible data store containing a computer program comprising instructions for causing one or more processors to operate as the node according to claim 1 when the instructions are executed by the processor or processors.

24. (Previously Presented) A storage medium carrying computer readable code representing instructions for causing one or more processors to operate as the node according to claim 1 when the instructions are executed by the processor or processors.

25. Cancelled

26. (Previously Presented) A tangible data store containing a computer program comprising instructions for causing one or more processors to perform the method according to claim 12 when the instructions are executed by the processor or processors.

27. (Previously Presented) A storage medium carrying computer readable code representing instructions for causing one or more processors to perform the method according to claim 12 when the instructions are executed by the processor or processors.

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28. Cancelled

29. (Previously Presented) A node as claimed in claim 1, wherein the node is adapted upon receipt of a request from a further node desiring to form its primary connection with the node, and in the event that none of the k-1 of further connections of the node is unallocated, to apply connection rules comprising:

selecting one of the further k-1 connections which is not a primary connection for one of the other nodes; and

re-allocating that selected further connection to the further node so as to form the primary connection for the further node.

30. (Previously Presented) A method as claimed in claim 12 wherein, upon receipt of a request from a further node desiring to form its primary connection with the node, and in the event that none of the k-1 connections of the node is unallocated, the node applies connection rules comprising:

selecting one of the further connections which is not a primary connection for one of the other nodes; and

re-allocating that selected further connection to the further node so as to form the primary connection for the further node.

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31. (Previously Presented) A method of joining a node to a network, the network having a topology type in which each node joining the network is constrained by the same connection rules to have a maximum number of connections, and wherein the peripheral nodes are not allowed to have fewer connections than the more central nodes in the network, wherein in order to join a new node to the network, the network comprising each node having at most k connections, the method applies the following connection rules in order to join a new node to said network in which each node has a maximum of k connections:

identify the node with the lowest height in the network hierarchy that is maintaining horizontal connections or unallocated links;

if the identified node has no free links, then request one of the horizontal connections to be terminated and re-allocated to the joining node, the link becoming vertical in the process,

initiating k-1 horizontal links between the joining node and other nodes in the network having the same height as the joining node and which are advertising a spare connection.

32. (New) A network of nodes, the network comprising:

a plurality of nodes which can be interconnected and disconnected from each other for communication purposes,

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a hierarchical structure in which a node is considered to be at a higher level than a parent node to which it connects when joining the network;

each node being arranged (a) to identify a parent node at the lowest level in the network that is able to maintain secondary connections to other nodes in the network of the same lowest level, (b) to request one of the second connections of the parent node to other nodes in the network of the same level be terminated and reallocated to the node if the identified parent node has no free links to become a primary connection between the identified parent node and the node, and (c) to initiate and maintain a specified number k-1 of further connections between the node and other nodes in the network having the same level in the hierarchy as the node and which are advertising a spare connection;

wherein the network has a topology type in which each node joining the network is constrained by the same connection rules to have a maximum number of k connections and wherein peripheral nodes have at least the same number of connections as more centrally situated nodes in the network.